CLAIMS:

1. A heat-resistant coated member in which a substrate consisting essentially of a metal selected from the group consisting of molybdenum, tantalum, tungsten, zirconium, titanium, and alloys thereof is coated with a layer consisting essentially of lanthanoid-containing oxide.

2. The heat-resistant coated member of claim 1, wherein the lanthanoid-containing oxide consists essentially of an oxide of at least one element selected from the group consisting of dysprosium, holmium, erbium, terbium, gadolinium, thulium, ytterbium, lutetium, europium and samarium.

3. The heat-resistant coated member of claim 2, wherein the lanthanoid-containing oxide consists essentially of an oxide of at least one element selected from the group consisting of ytterbium, europium and samarium.

4. The heat-resistant coated member of claim 1, wherein the layer consisting essentially of a lanthanoid-containing oxide is a lanthanoid-containing oxide layer containing ytterbium in an amount that accounts for at least 80 atom % of all the metal elements including lanthanoid elements.

5. The heat-resistant coated member of claim 1, wherein the layer consisting essentially of lanthanoid-containing oxide has a thickness of from 0.02 to 0.4 mm.

6. The heat-resistant coated member of claim 1, wherein the layer consisting essentially of lanthanoid-containing oxide is provided thereon with one or more layers comprising a compound of at least one element selected from among Group IIIA to Group VIII elements in the CAS version of the periodic table.

7. The heat-resistant coated member of claim 1, wherein the layer coated on the substrate is obtained by a thermal spraying operation.

8. A heat-resistant coated member in which a substrate composed of elemental carbon, is coated with a layer consisting essentially of lanthanoid-containing oxide.